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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/703,823	11/01/2000	Michael A. Davis	712-002-104	4186

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EXAMINER

LYONS, MICHAEL A

ART UNIT

PAPER NUMBER

2877

DATE MAILED: 07/28/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/703,823

Applicant(s)

DAVIS ET AL.

Examiner

Michael A. Lyons

Art Unit

2877

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 10 July 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 10 July 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                        | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948)     | Paper No(s)/Mail Date. _____  |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____   | 6) <input type="checkbox"/> Other: _____                                    |

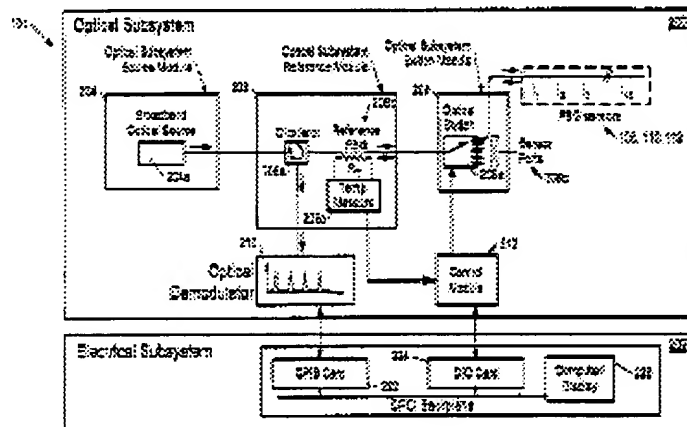
## DETAILED ACTION

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

**Claims 1-4 and 16-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Davis et al (6,403,949) in view of Othonos ("Fiber Bragg gratings").**



Regarding claim 1, Davis (Fig. 6) discloses an optical system comprising a broadband source 204a for providing a broadband optical signal, and a reference fiber Bragg grating 206b which can take the form of a fiber Bragg grating-based resonant cavity (col. 10, lines 58-67), for providing a Bragg grating etalon optical signal that is responsive to the broadband optical signal.

Davis fails to disclose the chirping of the Bragg gratings in the resonant cavity to form a chirped Bragg grating etalon.

Othonos, however, teaches the chirping of Bragg gratings, since chirping a Bragg grating enables the grating, instead of reflecting or transmitting a signal wavelength based on the construction of the grating, to reflect or transmit multiple wavelengths based on the configuration of the chirp along varying points on the grating.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use a chirped Bragg grating etalon as the reference resonant cavity of Davis as per Othonos, the motivation being that the linear functionality of the resonant frequency of a chirped grating allows for multiple wavelengths to be picked off by a single chirped etalon while being thermally stable (pg. 4327, col. 1).

As for claim 2, the construction of a chirped Bragg grating etalon is, inherently, a pair of chirped Bragg gratings.

As for claim 3, "in a chirped grating, the resonant frequency is a linear function of the axial position along the grating so that different frequencies, present in the pulse, are reflected at different points and, thus, acquire different delay times" (Othonos pg. 4327, col. 1).

As for claims 4 and 20, as with the functionality of any etalon, the wavelengths of the light beam that are not within the resonant frequency or frequencies of the etalon will pass through the etalon unaffected.

Regarding claims 16-19, see the above arguments with regards to claims 1-4.

**Claims 5-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Davis et al (6,403,949) in view of Othonos ("Fiber Bragg gratings") as applied to claim 1 above, and further in view of Duck et al (5,615,289).**

As for claims 5-12 and 15, Davis and Othonos disclose the claimed invention as described above with regards to claim 1. However, the combined device only discloses an optical demodulator 210 for correcting error and not an optical filter (either generic or bandpass as in claims 6 and 11) for filtering the optical signal so that only the desired reference wavelength peaks remain.

Duck, however, teaches the use of an optical bandpass filter “that is formed within an optical fiber in the form of a Bragg grating” (Duck abstract).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to add an optical filter as per Duck to the combined device of Davis and Othonos, the motivation being that the use of a Bragg grating optical filter (as claimed in claims 7-10 and 15) or a generic optical filter will suppress the broadband signal at the beginning and end of the spectrum that passes through the chirped Bragg grating etalon unaffected, leading to the only signals remaining in the optical system to be the signals representing the reference wavelength peaks generated by the resonant frequencies of the chirped Bragg grating etalon.

Furthermore, as to the arrangement of the device so that part of the suppressed optical reference signal being directed to an output port, it has been held that rearranging parts of an invention involves only routine skill in the art. *In re Japiske*, 86 USPQ 70.

As for claims 13-14, Davis discloses an optical directional device for directing the chirped Bragg grating etalon optical signal in the form of an optical circulator 206a.

### ***Response to Arguments***

Applicants’ arguments filed July 10, 2006 have been fully considered but they are not persuasive.

The applicants' arguments focus on the fiber Bragg sensors 108, 110, and 112 in Figure 6 of the Davis reference. The claim, however, looks to provide optical *reference* signals (emphasis added). The Bragg sensors cited in the arguments are the measurement gratings, and not the reference grating, said grating being element 206b in the figure. It is this grating, and not the sensors as argued by the applicants, that provides the reference signal. This reference grating is also naturally responsive to a broadband optical signal; the Davis reference provides a broadband source 204a for the system, and a grating that doesn't respond to a broadband signal simply wouldn't work within such a system.

The applicants' arguments also state that the Davis reference fails to teach a grating etalon. Once again, the examiner disagrees. In the rejection above, the examiner cites Column 10, lines 58-67 as evidence directly from the Davis reference of the use of a fiber Bragg etalon within the Davis system. From the reference, Davis states: "As another option, a Fabry-Perot etalon or a fiber Bragg grating-based resonant cavity can be used in place of the single reference fiber Bragg grating". Clearly, Davis discloses the use of fiber Bragg grating etalons to provide reference signals within an optical system.

From the above, the only remaining lack of Davis is the chirping of the gratings. As the applicants state, the examiner turns to Othonos for the mere disclosure of the chirping of Bragg gratings. However, since Othonos discloses the chirping of Bragg gratings, and the explicit motivation to do so as provided in the rejection above, it remains more than adequate as a secondary reference to Davis, which obviously provides the rest of the claimed limitations. As such, the rejection is valid and stands as above, in light of the applicants' arguments.

***Conclusion***

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

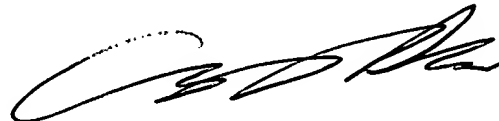
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael A. Lyons whose telephone number is 571-272-2420. The examiner can normally be reached on Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory J. Toatley can be reached on 571-272-2800 ext. 77. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2877

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

MAL  
July 17, 2006



**HWA (ANDREW) LEE**  
**PRIMARY EXAMINER**